

FY05 Goal – Environmental Management Certification Courses

- Offer one course in environmental technology

The Environmental Management Certificate program is a prototype certificate program being developed by Cleveland State University, with the support of the NASA Glenn Research Center. Students completing the certificate courses will be able to apply the credits towards one of several environmental graduate degrees, depending upon the specific goals of each student.

In the spring of 2005, Dr. Walter Kocher conducted a Class CVE 450-Environmental Technologies through Cleveland State University/NASA Glenn Research Center/Ohio's Aerospace Institute. Three NASA employees participated as did 11 other students from Cleveland State University.

The class was comprised of an introduction to environmental quality, water resources, wastewater treatment, air pollution, solid and hazardous waste management, and waste site remediation. There was emphasis on solutions to business, industrial, and manufacturing problems; including site audits, pollution prevention, and regulatory issues.

Through the use of formulas based on Mass Balances, Kinetics, and Reactor Modes, students were able to analyze outcomes of the interactions of several types of environmental treatment activities. Such activities and treatments included the physical, chemical, preliminary and secondary treatment activities of waste water, drinking water, and air quality. Treatment activities for storm water treatment, hazardous waste, and radioactive waste were also reviewed. The formulas offered an engineering insight into the sizing of a treatment plant for expected influent, the determination of how much by-product would still exist, and the anticipated attainment of regulatory limits on the effluent.

The class also reviewed activities such as pollution prevention, sustainability, and the overall effects of the pollution we generate upon ourselves and the environment.

Finally, students were assigned to groups to present reports and presentations on activities and processes that may cut the pollution generation that is currently occurring at a location. Example: reduction of coal consumption at a coal-powered generator plant through the integration of solar or wind power in the community.

Alternative power supplies, including geothermal, batteries and hydrogen were further researched for their feasibility at NASA GRC and Plum Brook Station. Though found to have high initial costs, over the long-term the cost savings of systems such as solar and wind will pay for themselves while at the same time reducing the energy costs of the Center. These alternative energy systems would also decrease the Center's reliance on fossil-based fuels and decrease, if not eliminate, the emission of associated pollution.

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